

10/15/03 96

Patent Claims

1. An optoelectronic sensor for demodulating a modulated photon flux (50) having
5 a semiconductor region (10),
at least two collecting zones (20, 22) present in the semiconductor region (10) and serving for collecting and tapping off minority carriers (11) generated when a modulated photon flux (50) penetrates into the
10 semiconductor region (10), the collecting zones (20, 22) being doped inversely with respect to the semiconductor region (10),
characterized by
at least two control zones (32, 34) introduced in the
15 semiconductor region (10) and serving for generating a drift field in a manner dependent on a control voltage that can be applied to the control zones (32, 34), the control zones (32, 34) being of the same doping type as the semiconductor region (10).
20
2. The optoelectronic sensor as claimed in claim 1,
wherein
the semiconductor region (10) is situated above or in
25 a semiconductor substrate (12), which is doped more highly than the semiconductor region (10).
3. The optoelectronic sensor as claimed in claim 1,
wherein
the semiconductor region (10) is applied on a
30 dielectric (12).

4. The optoelectronic sensor as claimed in one of claims
1 to 3,
wherein

5 the control zones (32, 34) are at a greater distance
from the midpoint of the sensor than the collecting
zones (20, 22).

10 5. The optoelectronic sensor as claimed in one of claims
1 to 4,
wherein
the semiconductor region (10) is p-doped.

15 6. The optoelectronic sensor as claimed in one of claims
1 to 5,
wherein
the collecting zones (20, 22) are diffused.

20 7. The optoelectronic sensor as claimed in one of claims
1 to 5,
wherein
the collecting zones (20, 22) are produced by local
charge transfers in the semiconductor region (10).

25 8. The optoelectronic sensor as claimed in one of claims
1 to 7,
wherein
the collecting zones (20, 22) are formed as Schottky
diodes.

30 9. The optoelectronic sensor as claimed in one of claims
1 to 8,
wherein
in the semiconductor region (10), more than one
35 collecting zone pair is embedded between two control

zones (32, 34) or two capacitive elements (35, 36; 37, 38).

10. A measuring device in particular for 3D distance
5 measurement having

at least one optoelectronic sensor as claimed in one
of claims 1 to 9,

an optical transmitter for generating a modulated
photon flux having a predetermined phase,

10 a device (60) for generating a control voltage, the
phase of the control voltage being in a fixed
relationship with the phase of the photon flux
generated by the transmitter, and

15 an evaluation device (40, 42) assigned to the
collecting zones (20, 22) and serving for determining
the amplitude and the phase of the modulated photon
flux with respect to the phase of the control voltage.

20